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RESULTS OF SCIENTIFIC RESEARCH OF THE
ACADEMY OF SCIENCES GEORGIAN SSR, 1948

The Academy of Sciences Georgian SSR accomplished much during 1948. Most of the plans for scientific research were fulfilled satisfactorily, and in many instances were significantly surpassed. Active and corresponding members published many important works. The monograph, "History of Evolutionary Paleontology from Darwin to the Present Time" by Active Member L. Sh. Davitashvili, was awarded the Stalin Prize.

The academy completed works related directly to national economic problems of the Georgian SSR. However, their importance extends beyond the boundaries of the republic.

A group of institutes under the Department of Mathematics and Natural Sciences achieved important results in 1948. At the Institute of Mathematics the development of the linear and nonlinear theory of elasticity was continued intensively. General integrals were found for equations in the theory of elastic shells, allowing the effective solution of many important practical problems.

The astronomers of the Abastuman Astrophysical Observatory, located on Kanobila Mountain, made important achievements. One of the basic problems was the study of cosmic absorption of stellar light. During the past year the study of selective absorption of light in the galaxy, according to the color excesses of a large number of comparatively weak stars, has been completed.

The Physics Institute completed a work entitled "Internal Conversion Considering the Magnetic Moment of the Electron in the M-Shell." In this work the coefficient of internal conversion was computed, taking into account the magnetic moment of electrons in M-shells. The Institute of Chemistry established the possibility of obtaining caustic soda and sedimentary baryt from local raw materials, mirabilite and baryt, and developed an industrial process which, in accordance with a resolution of the government, will be introduced into industry in the near future. The seeds of Georgian tea yielded a surface-active substance called saponin, which has wide application in the national economy, particularly

- 1 -

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in the production of plastics, rubber, in the food and pharmacochemical industries, etc. One of the characteristics of saponin, as proven by industrial tests, is high activity.

Significant achievements realized by the Institute of Geology and Mineralogy include the works, "Geology of the Petroleum-Bearing Regions of Eastern Georgia" and "The Pre-Miocene Effusive Vulcanism of Georgia."

The Institute of Geography Imeni Vakhusha conducted a physico-geographic and economic geographical study of Klukhorsk Rayon. The institute published a monograph, "The Geomorphological Regions of Georgian SSR," in a publication of the Academy of Sciences USSR.

The Department of Agricultural Sciences significantly reorganized its activities along the Michurin-Dokuchayev-Vil'yams line.

Grass blends for low-lying irrigated and nonirrigated zones, for the hilly regions of Eastern Georgia, and also for the foothill regions of Western Georgia were developed by the Institute of Husbandry. Particular attention was also given to agrotechnics and the selection of Kakhetian branchy wheat, which significantly outstripped local, regional varieties in many localities of eastern Georgia, yielding more than 40 centners per hectare. Through its experiments, the west Georgian Adsharetskaya Husbandry Testing Station developed grass-crop rotation for the kolchozes of western Georgia.

In 1948, the Institute of Viticulture and Viniculture completed especially important work to determine the areas best suited for grape culture. On the basis of work done by the institute, appropriate changes in existing agricultural rules were made. The Sakarskaya Experimental Station developed measures to improve vine yield on existing plantings by 50-100 percent. The station was also successful in developing new varieties of grapevines. The Tsitkala-Shardone is notable among a number of varieties obtained. This hybrid matures approximately 2 weeks earlier than the Shardone and exceeds it in productivity.

The Institute of Botany published a four-volume work entitled Flora of Georgia.

The Institute of Plant Protection conducted an extensive study on "mal'seko," a disease of lemons. On the basis of the results obtained, changes in existing rules for combating this disease were put into effect. Furthermore, plans were formulated to develop a mal'seko-resistant variety.

The Institute of Soil Science, Agricultural Chemistry, and Melioration analyzed the soils of the Klukhorsk Rayon. This institute also studied the wastes of geranium and coffee production and developed them as organic fertilizers. To a certain degree, this will compensate for the shortage of manure for subtropical farming in western Georgia.

The Power-Engineering Institute worked out scientific bases for power development in Georgia. The institute presented a method for selecting optimum parameters of hydroelectric stations in the republic and the solution for long-standing problems of seasonal and daily regulation of the system. Also, it studied the problem of priorities in building hydroelectric stations and a technical plan for using the Riona, Khrama, Ingura, and other rivers.

A rational thermal power balance was developed for Tiflis, and plans were drawn up for power supply with provisions for complete utilization of hydraulic and heat resources.

- 2 -

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The Construction Institute studied new types of construction and the use of local building materials. It also worked out the construction of stone buildings able to withstand powerful earth tremors.

The Zoological Institute, Department of Biological and Medical Sciences, studied the ecological and geographical distribution of rodents in Georgia.

The Institute of Experimental Morphology completed the work "On the Vascularity and Plasticity of a Transplanted Jejunum." This work revealed the limits of plasticity of the intestinal vessels, and changes taking place in the vessels of a transplanted jejunum, and specified operative techniques in enteroplasty. It was established that an unusual load for the transplanted jejunum causes sharp changes in its capillary network; the latter loses a number of the features characteristic to it and in a comparatively short time acquires the properties characteristic of capillaries of the colon. The experimental data obtained make it possible to simplify the operation.

The Institute of Physiology (men) I. S. Beritashvili worked on the problem "Activity of the Central and Peripheral Nervous Systems." The phenomena of the electric activity and reflector action of the spinal cord under the influence of various external factors were studied. In studying the electric activity of the spinal cord under the toxic effect of strychnine, valuable information on the activity of the nerve centers of the spinal cord and clarification of the mechanism of strychnine poisoning were obtained. The electric activity of the spinal cord was studied during general retardation caused by irritation of the trifacial nerve.

As a result of studies conducted by the Institute of Experimental and Clinical Surgery and Hematology, the aids of echinococcosis were established and measures for combating this disease were proposed. The Institute of Cardiology was successful in its study of the problem of hypertonia. "Experiment and Clinic on the Question of the Genesis Nephritic Hypertonia" was published as a monograph.

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- 3 -

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